

United States Department of Agriculture



Natural Resources Conservation Service
675 US Courthouse
801 Broadway
Nashville, Tennessee 37203

March 10, 2008

Mr. John Charles Wilson, Chairman
Shelby County Soil Conservation District
Suite 5, Box 22
7777 Walnut Grove Road
Memphis, Tennessee 38120

Dear Mr. Wilson:

This letter is notification that the Federal cost-share funds for the rehabilitation of Mary's Creek Structure No. 7 in Shelby County, Tennessee, has been approved and allotted to the State as requested in the rehabilitation plan. Work has already been done to assist you in completing the required obligation documents to implement the rehabilitation for Mary's Creek Structure No. 7.

If additional information is needed to process this request, please call me at (615) 277-2531 or Charles V. Roberts, Assistant State Conservationist (Water Resources), at (615) 277-2575.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin Brown", is written over a horizontal line.

KEVIN BROWN
State Conservationist

cc:

Charles V. Roberts, ASTC (Water Resources), NRCS, Nashville, TN
Carol Chandler, Biologist, NRCS, Gallatin, TN
Andy Neal, DC, NRCS, Memphis, TN
Robert Anderson, SCE, NRCS, Nashville, TN
Richard West, AC, NRCS, Jackson, TN

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SUMMARY OF WATERSHED PLAN

Project Name: Mary's Creek Rehabilitation Plan for Floodwater Retarding
Structure No. 7

County: Shelby State: Tennessee

Resource information:

Drainage Area:	431 acres
Land Use:	
Pasture:	102 acres
Woodland:	242 acres
Urban:	76 acres
Other:	11 acres

Land Ownership: 100% private

Number of Farms: 7

Average Farm Size: 162 acres

Prime farmland: 208 acres

Minority Farmers: 0

Limited Resource Farmers: 0

Wetlands: None

Floodplains: 158 acres

Areas of Controversy: None

Issues to be Resolved: None

Major Conclusions: Rehabilitation of Mary's no. 7 will have an overall positive impact on the resources and quality of life for watershed residents and downstream resources.

**National Water Management Center
Concerns/Recommendations for
Mary's Creek Watershed Plan-Environmental Assessment
Rehabilitation Floodwater Retarding Structure Number 7
Shelby County, Tennessee**

Concerns/Recommendations:

Hazard Classification:

Structure "Class A", class "A", "class C" class 'C' and class "C" are referred to in several places in the document. The NRCS convention for displaying structure class as found in Section 520.27 NEM and the NWSM is class (a) and class (c). The same is true for the structure class at the top of table 3. Class is only capitalized if it begins a sentence. Technical Release Number 60 indicates the trend of the agency to use low, significant and high for hazard classification. Suggest making global changes to the document to reflect NRCS standard designation for structure class.

Precision:

Recommend all elevations have the same precision in the document. Consider elevations to the nearest tenth.

Storm Frequency:

Storm frequency should include the associated duration to be meaningful.
Recommend including the storm duration for all discussions of storm frequencies throughout the document.

Page ii, Watershed Agreement, first paragraph; page 6, Project Costs; page 28, Rehabilitation; page 29, Table C, Rehabilitation; page 35, Table 1 and Table 2:

Using the values shown in Table 2, the following spreadsheet, 2-4-04 Rehab Cost Comp Guidance-Mary Creek 7 TN.xls was developed to provide the information for these items. The spreadsheet is attached.

Page vii, Watershed Agreement, paragraph (1)(a):

Typo; "...transactions y any..." should be "...transactions *by* any..."

Page 5, Threatened and Endangered Species and Cultural Resources:

Recommend changing "from" to "to occur in" or "to be found in".

Page 6, Environmental values changed or lost:

Recommend rewording and defining "low quality trees", by species, size, and frequency of occurrence or percent cover.

Page 6, Need for the Plan:

The "Purpose" should focus on flood damage reduction. You might consider statement such as, "The purpose of this action is to maintain the level of flood

protection afforded by the subject structure as it was originally designed for the next 100 years." The "Need" statement should focus on why the action is being considered. In this case it might look like the following, "The existing structure does not meet the current state safety and performance standards, and the flood protection provided by the structure is needed even to a greater extent than it was at the time of construction." This section can be strengthened by including the current structure does not meet State dam safety standards and/or NRCS standards. The section should include the state dam safety officer's assessment or recommendations for the dam.

Page 10, Geology, third paragraph:

Reference 2 on page 41 shows 1976 publication rather than the 1979 shown on page 10. Reference 6 on page 41 shows 1979 publication rather than the 1977 shown on page 10. Recommend verifying the publication dates and make the appropriate corrections.

Page 10, Cultural Resources and Threatened and Endangered Species:

Suggest changing the first "from" to "to occur", and the second "from" to "to occur in".

Page 11, Threatened and endangered species:

The "status" designations such as "S1", "G5" should be defined.

Page 21, Effects of Alternative Plans:

The effects on all the medium and high ranking concerns are supposed to be identified in the text (NWSM Section 504.38(d)). Property values were identified as a medium ranking concern. Recommend "Property values" narrative be presented in the effects of alternatives.

Page 24, Streams, Lakes and Wetlands:

The text should clearly describe the size and type of wetlands present. The text should indicate what portion of the 20.8 acre area is wetlands and the type(s) of wetlands present. Recommend removing "low quality" and further describing the size and characteristics of the vegetation present.

Page 29, Table C, Structural, Rehabilitation:

Typo; "...reised..." should be "...raised..."

Page 30, Fish and Wildlife Habitat:

Recommend removing "Low Quality" from third column.

Page 32, Risk and Uncertainty:

Recommend the uncertainty of estimations regarding sedimentation be made clear in this section.

Page 32, Risk and Uncertainty, first paragraph, first sentence:

Either "...three factors..." should be "...two factors..." or a third factor should be included in the narrative.

Page 32, Risk and Uncertainty, last paragraph:

Shelby County is shown as participating in the FEMA National Flood Program. Shelby County should have restrictions on development in the 100-year 24-hour floodplain. Recommend verifying any restrictions and include in the narrative.

Page 33, Recommended Plan:

Recommend including text related to the need for a new project agreement or permits that are likely to be needed in this section. The EA should disclose impacts and mitigation requirements. Recommend further discussion/site visits with the Corps and disclosure of permit requirements and any appropriate mitigation.

Page 33, Recommended Plan, Measures to be installed:

Since the riser must be modified to meet current seismic standards, recommend replacing the square riser with the Standard D x 3D riser.

Page 36, Total Capacity:

The total capacity should equal the sum of the storage volumes. As shown in Table 3, the total capacity should be 231.8 acre-feet. Please verify the storage volumes and include the sum of the volumes as the total capacity.

Page 36, Capacity, Sediment:

The sediment volume of 82.8 acre-feet equates to 2.3 watershed inches. Please verify the sediment volume and sediment watershed inches.

Page 39, Table 6:

In accordance with instruction 6, the benefit cost ratio should be expressed to the nearest tenth.

Appendix B:

Based on the discussion of development downstream of the structure, a support map identifying an urban flood plain would add value to the document (NWSM 504.43(b)).

Reviewers:

Terry Atwood, Water Resource Planning Specialist
David Heffington, Ecologist
James Moore, Civil Engineer
Tim Sweeney, Water Resource Planning Specialist

**National Water Management Center
Review Comments for
Mary's Creek Watershed Plan-Environmental Assessment
Rehabilitation Floodwater Retarding Structure Number 7
Shelby County, Tennessee**

General Comments:

The plan is written in a clear and concise manner. Hopefully, the comments which follow will make it an even better plan.

Potential Alternative:

No residences or commercial structures were identified in the breach inundation area. An alternative should be developed to rehabilitate the dam to low hazard criteria and place zone restrictions on the downstream inundation area. It appears raising the one road impacted may be a feasible alternative. If this alternative is not developed, the reasoning should be included in the plan.

Wetlands:

The Plan/EA should clearly identify the amount (acreage) and type (Cowardin or other detailed description) of wetlands present in the "setting" section and the impact of each alternative by acreage and type for each alternative in the "effects" section. On page 4, the summary indicates that there are no wetlands. On page 10, the text indicates there are no wetlands outside the pool area. Recommend wetlands within the pool area be included and described.

Investigation and Analysis Appendix:

Recommend including the "Investigation and Analysis" appendix which contains information which is required according to National Watershed Manual (NWSM) Section 504.43(c).

Watershed Agreement:

The following items should be incorporated in the supplemental watershed agreement:

1. The term of the agreement should be included. A typical statement is as follows:
"The term of this agreement is for the expected life of the project (100 years) and does not commit the NRCS to assistance of any kind beyond the end of the program life unless agreed to by all parties."
2. The requirements to develop an Emergency Action plan should be included in the agreement. A typical statement is as follows:
"The sponsors will provide leadership in developing an Emergency Action Plan (EAP) prior to construction and will update the EAP annually with local emergency response officials. NRCS will provide technical assistance in

preparation and updating of the EAP. The purpose of the EAP is to outline appropriate actions and to designate parties responsible for those actions in the event of a potential failure of a floodwater retarding structure."

Landrights:

Additional land is required to widen the auxiliary spillway and increasing the footprint of the dam. If the sponsor acquires additional landrights, the costs should be included and displayed in Table 2. Real property clause should be included in the watershed agreement as follows (NWSM Figure 504-1, item 1):

"The sponsor will acquire with other than Public Law 83-566 funds, such real property as will be needed in connection with the works of improvements.
(Estimated Cost \$ ____.)"

Land Treatment:

NRCS policy requires 50% of the watershed area above the dam to have adequate land treatment measures. The adequacy of land treatment above Site 7 needs to be addressed in the document. The following two items may be needed in the watershed agreement to address the sponsor responsibility for land treatment:

1. The sponsors will obtain agreements from owners of not less than 50 percent of the land above each multiple-purpose and floodwater-retarding structure. These agreements state that the owners will carry out conservation farm or ranch plans on their land. The sponsors will ensure that 50 percent of the land upstream of any retention reservoir site is adequately protected before construction of the dam.
2. The sponsors will encourage landowners and operators to continue to operate and maintain the land treatment measures after the long-term contracts expire, for the protection and improvement of the watershed.

Specific Comments:

Cover:

Recommend including the plan status on the cover and titles in the document (NWSM Section 504.32):

Page ii, Watershed Agreement, first paragraph; page 6, Project Costs; page 28, Rehabilitation; page 29, Table C, Rehabilitation; page 35, Table 1 and Table 2:

The dollar figures shown in these sections and tables are not consistent with those generated by the spreadsheet tool available at:

<http://wmc.ar.nrcs.usda.gov/technical/WS/costcomprehab.html>. The tool indicates total installation cost in Table 2 is \$440,300. The NRCS construction cost should be \$224,800 and the sponsors construction cost should be \$81,100. The sponsor's project administration costs are eligible for cost-share. Recommend verifying the cost distribution with the spreadsheet tool and make the appropriate changes in the agreement, referenced sections, Table C, Table 1 and Table 2. Recommend using the

format and footnotes from the spreadsheet tool for the cost items in the watershed agreement.

If the recommended format from the spreadsheet tool is not used in the watershed agreement, Item 8 from Figure 504-1 of the NWSM must be included in the watershed agreement.

Page ii, Watershed Agreement, third paragraph, second sentence:

The final costs are the actual costs for installation of the works of improvement. Recommend changing "...will be the average costs incurred..." to "...will be the actual costs incurred..." to be consistent with NWSM Figure 504-1, Item 14.

Page iv, Watershed Agreement, third paragraph:

The definition of "Conviction" is missing "guilt" in the present NWSM. This will be corrected in the new NWSM. Recommend changing the first sentence

FROM: "...means a finding of (including a plea of..."

TO: "...means a finding of guilt, (including a plea of..."

Page 4, Summary:

Recommend including "Number of farms", "Average farm size", "Number of limited resource farmers", "Major conclusions", "Areas of controversy" and "Issues to be resolved" in the Summary to be consistent with NWSM Figure 504-4.

Page 5, Summary, Problem Identification:

The third sentence indicates "two major roads" would be affected by the dam breach. Page 6 indicates "four roads" would be affected. Page 12 indicates "four roads" would be inundated. Page 13 indicates "a single road" would be affected. Page 19 states one "road connecting the Spring Manor subdivision will be overtopped". Page 21 indicates four roads would be affected. Recommend verifying the number of roads overtopped by the dam breach and make the appropriate corrections in the document.

Page 5, Summary, Project Purpose:

It is the intent of the NWSM to have the PL 83-566 project purpose identified in the summary. Recommend "flood prevention" be identified as the project purpose in this section of the plan.

Page 9, Soils, second sentence:

Many abbreviated soil series are included in the second sentence. Recommend defining the soils series in the narrative or including and referencing a soil map with the soil series defined.

Page 10, Streams and wetlands:

Recommend the wetlands in the pool area be quantified and classified by type or otherwise described.

Page 13, Hazard Classification:

The document did not include the depth of flooding from the dam breach analysis in residential structures, commercial structures or over roadways. Page 19 states "...no structure or infrastructure (other than roads) will be impacted..." A catastrophic dam breach causing damage to a minor or county road usually results in a low hazard classification for a dam. A catastrophic dam breach causing damage to a major road usually results in a significant hazard classification for a dam. Though damages could occur downstream, an instantaneous breach of the dam would remove the storage volume of the reservoir in minutes. Recommend including the depth of flooding in residential structures, commercial structures and over roadways from the dam breach analysis to justify the high hazard dam classification. Recommend including the concurrence of the dam hazard classification by NRCS State Conservation Engineer. Recommend including the State of Tennessee Safe Dam Agency dam hazard classification. Recommend including the dam deficiencies identified by the State of Tennessee Safe Dam Agency.

Page 16, Status of Operation and Maintenance:

This section states "It is not known for how long the gate has failed to work." Page 12 states the gate "...has been left in the open position since the completion of the dam..." Page 12 implies the gate has not operated for 48 years. Rehabilitation does not include O&M activities (NWSM Section 508.40). Recommend clarifying whether the inoperable gate is a design deficiency, construction deficiency, operator error, or maintenance item from the O&M plan for the sponsor.

Page 17, Problems and Consequences of Dam Failure:

This section should explain what happens if there were to be a catastrophic failure of the dam. The consequences of dam failure are not intended for incorporation into the economic or other analyses. This section is intended to provide a sense of why it would be desirable to reduce the threat of a catastrophic dam failure. The section should describe the expected consequences of a catastrophic dam failure under the pool conditions described in the breach analysis. The consequences would describe the human lives and the property at risk in the breach inundation area. The section should describe the potential loss of human life; infrastructure damage (such as roads, bridges, and utilities); likely damage to stream systems, wetlands, and other environmental damages, and long term erosion and sedimentation issues associated with the sediment pool of a catastrophically breached structure. Deciders will be better able to understand the potential loss of human life if some indication can be provided as to the depth and velocity of the floodwaters. Sediment discussions should address both quantity and quality issues. Physical data is to be used where readily available but verbal descriptions of likely consequences based on site observations may be used where other sources of data are not available.

Page 19, No Action, second paragraph, fourth sentence:

The sentence indicates higher damages due to development of residential and commercial properties. Recommend identifying the number of residential and

commercial properties that would be in the 100-year 24-hour floodplain without the flood protection of the dam.

Page 23, Erosion and Sedimentation, Rehabilitation, fourth sentence:

Recommend indicating the NRCS model used to predict the sediment storage.

Page 23, Archeological and Historical Resources, Existing Condition:

The text should disclose the result of coordination with tribes and the SHPO.

Page 26, Erosion and Sedimentation:

This section appears to be from Mary's Creek Site 8. It is the second "Erosion and Sedimentation" section in the Effects of Alternative Plans. Recommend deleting this section or combining appropriate information with the first "Erosion and Sedimentation" section.

Page 27, Economic and Social, Decommissioning:

Recommend identifying the number of residential and commercial properties that would be in the 100-year 24-hour floodplain without the flood protection of the dam.

Page 33, Consultation and Public Participation:

Recommend documenting any widely advertised public meeting according to NWSM Section 505.04 in this section. Recommend consultation with SHPO and effected tribes be documented in this section according to NWSM Section 504.39.

Page 33, Recommended Plan, Measures to be installed:

The square riser does not meet the Standard D x 3D riser required by NRCS (TR-60 page 6-2). The minimum pipe diameter on yielding foundations is 30 inches (TR-60, page 6-3). A variance of NRCS standards from CED is required maintain the square riser and 24 inch barrel. The variance must be granted by CED and documented in the plan prior to interagency review.

Page 34, Recommended Plan, Installation and Financing:

Recommend including a statement related to the discovery of cultural resources in this section. NWSM Section 504.40(e)(7)).

Pages 35-39, Table 1-6:

Recommend including the "Month/year" in the lower right corner of Tables 1 thru 6.

Page 35, Table 1, Note 2:

The federal cost share is based on all eligible project costs which is greater than the construction costs. Recommend verifying the total eligible project cost and revising Note 2.

Page 35, Table 2, Note 2:

The federal cost share is based on all eligible project costs which is greater than the construction costs. Recommend verifying the total eligible project cost and revising Note 2.

Page 36, Table 3, Auxiliary Spillway Bottom Width:

The auxiliary spillway bottom width is shown as 250 feet in Table 3. The remainder of the document indicates the auxiliary spillway bottom width is planned to be 200 feet. Recommend verifying the auxiliary spillway bottom width and make the appropriate changes in the document.

Page 36, Table 3, Maximum Height of Dam:

The maximum height of dam is shown as 22.4 feet in Table 3. The "Original Project" section indicates the embankment is 28.5-feet high (page 7). The "Measures to be installed" section states the "...maximum fill height of 23.4 feet (1.9 feet above the existing embankment..." Recommend verifying the maximum height of dam and make the appropriate changes in the document.

Page 36, Table 3, Volume of Fill:

The volume of fill is shown as 23,000 cubic yards in Table 3. The "Measures to be installed" section indicates the additional fill material is 15,700 cubic yards. Recommend verifying the additional volume of fill and make the appropriate changes in the document.

Page 36, Table 3, Freeboard Hydrograph:

Recommend including the "Storm Duration" of the freeboard hydrograph. Recommend adding a footnote indicating the 6-hour and 24-hour freeboard storm was analyzed and the more restrictive was used to determine the maximum water surface elevation.

Page 38, Table 5 and page 39, Table 6:

The text distinguishes between Agricultural and Non-Agricultural types of benefits. Paragraph 8 on page 504-60 of the NWSM recognizes damages to rural communities as being agriculture-related. Reductions in damages to rural communities would therefore be agriculture-related. Watershed Projects Division letter of 22 February 1993, (Subject: PDM—Definition of Rural Communities for use in Determining Eligibility for Flood Prevention Projects To Be Installed with Financial Assistance Provided by Public Law 83-566) redefined a rural community as having a population less than 50,000. If the population of each local community is less than 50,000, benefits accruing thereto would be considered agricultural. Recommend distinguishing between the agricultural and nonagricultural damages and benefits for with project and without project conditions and include in Tables 5 and 6 (NWSM Figures 504-16 and 504-18).

Page 39, Table 6:

Recommend adding footnotes to indicate the "Average Annual Benefit" is from Table 5 and the "Average Annual Cost" is from Table 4.

Reviewers:

Terry Atwood, Water Resource Planning Specialist

David Heffington, Ecologist

James Moore, Civil Engineer

Tim Sweeney, Water Resource Planning Specialist

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